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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,412	06/21/2001	Jerome E. Lengyel	MS1-603US	8941

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EXAMINER

NGUYEN, KIMBINH T

ART UNIT PAPER NUMBER

2671

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24

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

09/887,412

Applicant(s)

LENGYEL, JEROME E.

Examiner

Kimbinh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 June 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☒ Claim(s) 2-4,6 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.                      6) ☐ Other:

### DETAILED ACTION

1. Claims 1-22 are pending in the application.

#### ***Claim Objections***

2. Claims 2, 3, 4, 6 and 7 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

For the purpose of this Office Action, Examiner assumed that: claims 2 and 4 depend from claim 1; claim 3 depends from claim 2; claim 6 depends from claim 5; and claim 7 depends from 6.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-6 are rejected under 35 U.S.C. 102(a) as being anticipated by Kim et al. "A Thin Shell Volume for Modeling Human Hair", IEEE, published May 2000, pages 104-111.

**Claims 1 and 6**, Kim et al. teaches generating a mesh grid (3D grid) of uncovered surfaces of the object (hair strands; page 105, lines 18-21 of the left column;

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figs. 1(c) and 2.); simulating hair in each of the grid elements (inside the grid, a number of hair strands are evenly distributed. Each cell of the grid is associated with a list of particles that reside inside it, see page 105, lines 18-21 of the left column; lines 20-23 of the right column; fig. 1(c) and fig. 2); sampling the hair into a volume texture on per-grid element basis (placing hair particles inside the volume, see page 106, the right column, section "3. Virtual Hair Combing").

**Claim 2**, Kim et al. teaches parameterizing a texture in each of the grids (in fig. 1(c), a TSV is parameterized by the three variables (s, t, u), see page 105, section 2.1).

**Claim 3**, Kim et al. teaches identifying interactive (hair-to-hair interaction, see abstract) control and/or viewing parameters associated with each grid of the mesh parameters (s, t, u) corresponding to the parameter (i, j, k) of the grid index) which determine what elements of the surface detail model are used to render surface detail in that grid element (each cell of the grid is associated with a list of particles that reside inside it, see page 105, section 2.1 and fig. 2).

**Claim 4**, Kim et al. discloses generating a shell texture model (TSV Model, fig. 3) for each grid of the mesh on the parameterization (s,t,u) of the grid elements (see page 105, section 2.1; section 2.2 page 106; figs. 2 and 3).

**Claim 5**, Kim et al. teaches generating a shell texture model (Thin Shell Volume (TSV) Model) for each element of a dynamically generated grid of uncovered surfaces of an object (vertical motions of particles, see pages 107-108, section 3.4 Vertical Motion (u-direction; using the standard dynamics techniques for each strand's motion, see page 108, section 5. Animation).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. "A Thin Shell Volume for Modeling Human Hair", (IEEE, published May 2000, pages 104-111) in view of Meyer et al. "Interactive Volumetric textures" (iMAGIS laboratorie GRAVIR/IMAG-INRIA, France, published 1998).

**Claim 7**, Kim et al. does not teach transparent texture; however, Meyer et al. teaches utilizing the volume texture to generate (encode) semi-transparent (or transparent) concentric shells of the volume texture (slices of the volume which is concentrated in the neighborhood of the surface), which are layered over select areas of the object surface (are mapped onto underlying surface or superimposing these transparent slices, see abstract and section 1.1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching as taught by Meyer for mapping transparent layers into the Kim's method to generate transparent concentric shells of the volume texture with an extrusion offset, because it would increase the visual complexity of scenes displayed in the scope of interactive rendering (see conclusion).

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7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rouet et al. (5,758,046).

**Claim 8**, Rouet et al. teaches a storage medium (storage 110, fig. 1) which executable instruction to implement a modeling agent (col. 2, lines 49-56) to develop a surface detail model (geometric model for the actual hair, col. 3, lines 1-12; fig. 3), and to render surface detail (rendering Details) over an object surface (col. 5, lines 25-47). Rouet does not teach instruction to implement a modeling agent; however, Rouet teaches that "geometric interpolation and rendering are preformed in an iterative manner, such that the numerous fine-grained objects are process and rendered portion by portion, thereby greatly reducing the computational complexity of the task" (col. 1, lines 63-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the Rouet's teaching for implementing a modeling agent by using iterative generating and rendering of hair in order to achieve realistic modeling of hair computationally practical manner, because it would achieve a high-degree of visual realism demands that the computer-generated image reflect lifelike digital representations of fine-grained objects (col. 1, lines 15-16).

8. Claims 9-13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouet et al. (5,758,046) in view of Kim et al. "A Thin Shell Volume for Modeling Human Hair", (IEEE, published May 2000, pages 104-111).

**Claims 9 - 13**, Rouet et al. discloses a storage medium (see the rejection of claim 8 above), comprising claimed elements corresponding to claims 1, 2, 4 and 5 as taught by Kim et al. (see the rejection of claims 1, 2, 4 and 5 above). It would have been

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obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of modeling human hair as taught by Kim's method into the storage medium taught by Rouet's method to model and synthesizing realistic hair appearance and behavior, because it would implement a method of generating the appearance of hair is with texture polygons. This approach is widely used in many areas, for example, as virtual agents, avatars in virtual worlds (see Introduction, page 104).

**Claims 15-20** claim an apparatus comprising claimed elements corresponding to the rejection of claims 8-13; therefore, claims 15-20 are rejected under the same reasons set forth in claims 8-13.

9. Claims 14, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouet et al. (5,758,046) in view of Meyer et al. "Interactive Volumetric textures" (iMAGIS laboratorie GRAVIR/IMAG-INRIA, France, published 1998).

**Claim 14**, Rouet et al. discloses a storage medium (see the rejection of claim 8 above); Rouet does not teach generate semi-transparent; however, Meyer et al. teaches utilizing the volume texture to generate (encode) semi-transparent (or transparent) concentric shells of the volume texture (slices of the volume which is concentrated in the neighborhood of the surface), which are layered over select areas of the object surface (are mapped onto underlying surface or superimposing these transparent slices, see abstract and section 1.1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of interactive volumetric texture taught by Myers's method into the storage medium taught

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by Rouet's method to generate semi-transparent of the volume texture, because it would increase the visual complexity of scenes displayed in scope of interactive rendering (see section 7 conclusion).

**Claim 21**, the rationale provide in the rejection of claim 14 is incorporated herein.

**Claim 22**, Rouet et al. discloses a memory device (storage unit 110); a controller (CG 130, fig. 1) coupled to the memory device to implement the surface modeling agent (to perform the task of modeling, col. 2, lines 54-65; fig. 1).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Brinsmead et al. (5,764,233) discloses method for generating hair using textured fuzzy segments in a computer graphics system.
- Falk (4,888,713) discloses surface detail mapping system.
- Pfister et al. (6,509,902) discloses texture filtering for surface element.
- Suits et al. (6,525,731) discloses dynamic view-dependent texture mapping.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.



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Any response to this action should be mailed to:

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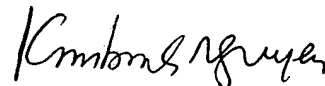
**Or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive,  
Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or  
proceeding should be directed to the Technology Center 2600 Customer Service Office  
whose telephone number is (703) 306-0377.

July 14, 2003



Kimbinh Nguyen

Patent Examiner AU 2671